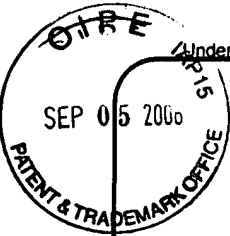


AF *[Signature]*

PTO/SB/21 (09-04)

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# TRANSMITTAL FORM

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First Named Inventor

JACKSON, J. R.

Art Unit

1742

Examiner Name

WILKINS, III, R. D.

Attorney Docket Number

FC 10

## ENCLOSURES (Check all that apply)

<input type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance Communication to TC
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Remarks

## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Andrew E. Pierce, Patent Attorney		
Signature	<i>Andrew E. Pierce</i>		
Printed name	Andrew E. Pierce		
Date	August 29, 2006	Reg. No.	26,017

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**FC-10 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Applicant: Jackson et al.

Examiner: WILKINS III., H.D.

Serial No.: 10/601,602

Group Art Unit: 1742

Filing Date: June 23, 2003

For: Low Energy Chlorate Electrolytic Cell and Process

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**APPEAL BRIEF UNDER 37 CFR 41.37**

09/06/2006 SSITHIB1 00000034 10601602

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## **REAL PARTY IN INTEREST**

- 1. Finnchem USA Inc, which is a wholly owned subsidiary of**
- 2. Finnish Chemicals Corporation, which is a wholly owned subsidiary of**
- 3. Finnish Chemicals Oy, Aetsa, Finland, which is a wholly owned subsidiary  
of**
- 4. Kemira Oyj, Helsinki, Finland.**

## **RELATED APPEALS AND INTERFERENCES**

**None**

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## **STATUS OF CLAIMS**

**Claims 1 - 7 have been withdrawn**

**Claims 8 - 17, amended in response under Rule 1.111, rejected**

**Claims 18 - 33 have been withdrawn.**

**Claims 34 - 35, added in response under Rule 1.111, rejected**

## **STATUS OF AMENDMENTS**

- 1. The Amendment under Rule 1.111 has been entered.**
- 2. The Amendment under Rule 1.116 and an Affidavit under Rule 1.132 were denied entry by the Examiner.**
- 3. The Affidavit under Rule 1.132, denied entry by the Examiner, has been entered, according to a decision on a Petition under 37 CFR 1.181 mailed on August 14, 2006.**

## **SUMMARY OF CLAIMED SUBJECT MATTER**

In one aspect (independent Claim 8) of the inventive electrolytic cell assembly for the production of an alkali metal chlorate, there is employed a low alkali metal ion transport efficiency (specification, page 13, lines 13 - 20 and page 14, lines 1 - 8) permselective polymer membrane electrolytic cell separator (specification, page 5, lines 15 - 18) between the catalytic, metal anode (specification, page 8, lines 19 - 20) and the catalytic, metal or gas-diffusion cathode of the electrolytic cell (specification, page 5, lines 18 - 20, page 6, lines 1 - 2, page 13, lines 13 - 20, and page 14, lines 1 - 8).

The use of the recited cell separator permits (1) the substitution of the titanium or mild steel cathodes of the prior art chlorate cells with precious metal oxide coated cathodes or oxygen reduction (gas-diffusion) cathodes (specification, page 17, lines 11 - 14) and (2) the confinement of the hydrogen produced in the cathode compartment of the cell (specification, page 7, lines 2 - 6).



- It is noted that the recited "low alkali metal ion transport efficiency permselective polymer membrane" of Claim 8 defines over the permselective polymer membranes used in chlor-alkali cells, which have high alkali metal ion transport efficiency (Affidavit under Rule 1.132, page 2, third paragraph).

In another aspect (independent Claim 34) of the inventive electrochemical cell assembly for the production of an alkali metal chlorate, there is employed a permselective polymer membrane separating the anode and cathode of the chlorate cell (specification, page 25, lines 10 - 12).

## **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

1. Whether Claims 8 - 12, and 17 are unpatentable under 35 U.S.C. 102 (b) over Kelham ('397) with evidence from deNora ('452) and deNora et al. ('979).
2. Whether Claims 8 - 12, 14, and 17 are unpatentable under 35 U.S.C. 102 (b) over Cohn et al. ('276) with evidence from deNora ('452).
3. Whether Claims 34 - 35 are unpatentable under 35 U.S.C. 102 (b) over Sawamoto et al. ('406).
4. Whether Claim 13 is unpatentable under 35 U.S.C. 103 (a) over Kelham ('397) in view of deNora et al. ('979).
5. Whether Claim 15 is unpatentable under 35 U.S.C. 103 (a) over Kelham ('397) in view of Brown et al. ('269).
6. Whether Claim 16 is unpatentable under 35 U.S.C. 103 (a) over Kelham ('397) in view of Kuo et al. ('531).
7. Whether Claims 34 - 35 are unpatentable under 35 U.S.C. 103 over Sawamoto et al. ('406) in view of Kuo et al. ('531).
8. Whether Claims 8 - 17 are unpatentable under 35 U.S.C. 112, first paragraph as being based upon a non-enabling disclosure.

## **ARGUMENT**

### **ISSUES FOR CONSIDERATION**

**I. Whether or not the preamble recited in claims 8 and 34 should be given patentable weight.**

**II. Whether or not the recitation of:**

**"...a low alkali metal ion transport efficiency permselective membrane separating an anode compartment and a cathode compartment..."**

**(of the electrolytic cell) in the applicants' claim 8 is a sufficient limitation taken alone so as to defeat the anticipation or obviousness rejections of the invention of the Applicants' claims 8 - 17 in view of the references cited by the Examiner.**

**III. Whether or not the invention of claims 8 - 17 is enabled under 35 U.S.C. first paragraph.**

**I.**

**THE PREAMBLE IN CLAIMS 8 AND 34 MUST BE GIVEN PATENTABLE  
WEIGHT IN ANY MEASUREMENT OF PATENTABILITY OF THE  
APPLICANTS' CLAIMED INVENTION**

The Examiner indicates in the final rejection that the preamble (directing the claimed assembly to use in the production of an alkali metal halate) of the Applicants' assembly recited in independent claims 8 and 34 has not been given patentable weight, citing MPEP 2114, (see page 10, first paragraph). This, presumably, is the basis for the citation of references (Kelham with deNora and deNora et al., or Cohn et al. with deNora, and Sawamoto et al.), which disclose chlor-alkali electrolytic cells as references for the anticipation and obviousness rejections of the claimed invention.

In view of the statement in the Affidavit under Rule 1.132, that chlor-alkali cells use high (rather than low) alkali metal ion transport efficiency cell membranes, one skilled in the art of chlorate electrolytic cells would not look to the chlor-alkali

cell technology to discover how to make improvements in a chlorate cell. In addition, the electrolyte environment of a chlorate cell bears no relation to that of a chlor-alkali cell electrolyte environment. The aqueous sodium chlorate electrolyte of the chlorate cell is highly corrosive to a precious metal coated cathode or to a gas-diffusion cathode making such cathodes unavailable for use in the prior art chlorate cells and thus, the energy savings attendant upon the use of such cathodes cannot be obtained. There is no disclosure or suggestion in the chlor-alkali cell references that such a cell can be used to make chlorate much less make chlorate in a continuous, cyclic process.

The closest known alkali metal chlorate cell prior art, cited by the Applicants in the specification on pages 1 - 5, does not teach or suggest the use of a permselective membrane cell separator, much less one having low alkali metal ion transport efficiency or the replacement of the mild steel or titanium cathodes used in prior art chlorate electrolytic cells with the more efficient catalytic metal or gas-diffusion cathodes used in the claimed inventive electrolytic cell assembly. Accordingly, these chlorate cell prior art references, would not anticipate or render obvious the Applicants' claims 8 - 17 and new claims 34 - 35.

-

It is submitted that had Jepson claim terminology been used in the applicants' original claims 8 and 34, such as the Jepson form preamble, as proposed in the amendment after final (which was not admitted by the Examiner), that this would have effectively delineated the scope of these claims as limited to chlorate cells and the appropriate prior art to chlorate cell technology. It is nothing less than the elevation of form over substance for the Examiner to maintain that the scope limiting nature of the present preamble of claims 8 and 34 ("An assembly for the...production of an alkali metal halate...") is not fully equivalent. Jepson terminology would not enlarge the scope of the claims, as proposed in the amendments after final rejection of claims 8 and 34. Such elevation of form over substance is considered not to advance the prosecution and tends to defeat the purposes of the patent system and the progress of the useful arts.

Generally, a preamble will be considered a limitation if the claim preamble recites essential structure or steps or if it is "necessary to give life, meaning, and vitality" to the claim (*Pitney Bowes*, 182 F. 3d at 1305). No litmus test defines when a preamble limits claim scope (*Corning Glass*, 868 F. 2d at 1257). However, certain

guidelines (exceptions to the general rule as stated in MPEP 2114), indicating when a preamble will limit the scope of a claim, have emerged from various decisions of the Court of Appeals for the Federal Circuit (Fed. Cir.) See *In re Stencel*, 828 F.2d 751, 754, 4 USPQ 2d 1071 (Fed. Cir. 1987) also cited in MPEP (8th Edition, Revision 4, October 2005) 2111.02, part I:

"[T]he framework - the teachings of the prior art - against which patentability is measured is not all drivers broadly, but drivers suitable for use in combination with this collar, for the claims are so limited."

To paraphrase the above as applicable here:

....the teachings of the prior art against which patentability is measured is not all electrochemical cells broadly, but cells suitable for use in producing chlorate, for the Applicants' claims are so limited.

(1) Jepson claiming generally indicates the intent to use the preamble to define the claimed invention, thereby limiting claim scope. See *Rowe*, 112 F.3d at 479 (Fed. Cir. 1997) and *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d at 1022, 1029, 61 USPQ 2d 1470, 1475 (Fed. Cir. 2002).

(2) The dependence on a particular preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and the body of the claim to define the claimed invention. See *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F. 3d 615, 620, 34 USPQ 2d 1816, 1820 (Fed. Cir. 1995).

(3) When the claim drafter chooses to use both the preamble and the body of the claim to define the subject matter of the invention, the invention so defined, and not some other, is the one the patent protects." or when the preamble is essential to understand limitations or terms in the claim body, the preamble limits claim scope. See *Pitney Bowes*, 182 F. 3d at 1306.

(4) When the preamble recites additional structure or steps underscored as important by the specification, the preamble may operate as a claim limitation. See *Corning Glass*, 868 F.2d at 1257, USPQ 2d 1962, 1966 (Fed. Cir. 1989); *General Electric Co. v. Nintendo Co.*, 179 F. 3d 1350, 1361-62, 50 USPQ 2d 1910, 1918-19 (Fed. Cir. 1999); *Rowe*, 112 F. 3d at 479-80 (Fed. Cir. 1997); and *Applied Materials*, 98 F. 3d at 1573.



(5) When the applicant exhibits clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art this transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention. See generally *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F. 3d 1368, 1375, 58 USPQ 2d 1508, 1513 (Fed. Cir. 2001).

(6) A preamble may limit the claim when relied upon to distinguish a new use of a prior art apparatus or process. Without such reliance, however, a preamble generally is not limiting when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention. See *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F. 3d 1422, 1434, 54 USPQ 2d 1129, 1136-37 (Fed. Cir. 2000).

(7) Preamble language merely extolling benefits or features of the claimed invention does not limit the claim scope without clear reliance on those benefits or features as patentably significant. See *STX, LLC v. Brine, Inc.*, 211 F. 3d 588, 591 (Fed. Cir. 2000)

Here, the preamble is essential to point out that the assembly invention claimed is an improvement in electrolytic cells such that the production of an alkali metal chlorate can be performed therewith in a continuous, cyclic process. Clearly, the Applicants have chosen to rely upon the preamble of Claims 8 and 34 to distinguish the claimed invention over the references cited by the Examiner.

It is considered that while MPEP 2114 may state the general rule regarding scope limiting preambles in article claims, the exceptions to the general rule enumerated above in items (1) - (7), which are in accordance with MPEP 2111.02, part II, last two (recently added) paragraphs, are more appropriately applied to the preambles of claims 8 and 34 such that:

(a) The Applicants' recitation of intended use of the assembly in a continuous, cyclic, electrolytic process in Claim 8 and Claim 34 and the clear reliance of the Applicants upon this preamble during prosecution:

(b) Distinguishes the claimed invention over the cited references by

(c) Transforming the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention.

In *Rowe v. Dror et al.* 112 F. 3d 473, 42 USPQ 2d 1550, (Fed. Cir. 1997) cited with approval in *Catalina Mktg. Int'l. v. Coolsavings.com*, referred to in MPEP, 2111,02, part II, the Court set forth guidelines for a determination of whether or not a preamble should be considered to define, in part, the claimed invention:

"The determination of whether preamble recitations are structural limitations or mere statements of purpose or use "can be resolved only on review of the entirety of the patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim." *Corning Glass Works*, 868 F. 2d at 1257. The inquiry involves examination of the entire patent record to determine what invention the patentee intended to define and protect. See *Bell Communications*, 55 F. 3d at 621 (looking to patent specification to determine whether claimed invention includes preamble recitations); *In re Paulsen*, 30 F. 3d 1475, 1479, 31 U.S.P.Q. 2D (BNA) 1671, 1674 (Fed. Cir. 1994) (examining "patent as a whole"); *Vaupel Textilmaschinen KG v. Meccanica Euro Italia SPA*, 944 F. 2d 870, 880, 20 U.S.P.Q. 2D (BNA) 1045, 1053 (Fed. Cir. 1991) (looking to claims, specification, and drawings); *Gerber Garment Tech., Inc. v. Lectra Sys., Inc.*, 916 F. 2d 683, 689, 16 U.S.P.Q. 2D (BNA) 1436, 1441 (Fed. Cir. 1990) (noting that preamble recitations provided antecedent basis for terms used in body of claim); *Corning Glass Works*, 868 F. 2d at 1257 (considering the specification's statement of the problem with the prior art); *Kropa*, 187 F. 2d at 152 (noting that preamble sets out distinct relationship among remaining claim elements)."

Inspection of the entire record in this case reveals that an alkali metal halate electrolytic cell is, in fact, a structural limitation of the applicants' claims. To begin with, the applicants clearly intend to limit the scope of their claims to an electrolytic cell for the production of an alkali metal halate, as evidenced by the specification statement of the Field of the Invention and the Related Art and the consistent reliance during prosecution upon the scope limiting effect of the preamble of claims 8 and 34. In the chlorate cells of the prior art, the anode and cathode are exposed to the same electrolyte, there being no cell separator of any kind. It is in the nature of a pioneer invention that the Applicants' claimed invention departs from the prior art chlorate cell by using a cell separator.

What the Applicants invented (Claims 8 - 17) was an assembly including an electrolytic cell to produce an alkali metal halate which contains a specific cell separator, a structure not disclosed as used before in such an electrolytic cell or in any of the chlor-alkali or other cells (which are not chlorate cells) disclosed in the references cited by the Examiner. During prosecution, the Applicants clearly relied upon this structural difference, to distinguish over the structural differences of the chlor-alkali cell separators. Simply employing a cell for the production of chlor-alkali would not allow the Applicants' cell to function as intended unless the particular cell separator disclosed by the Applicants is used, which is defined in claim 8 as having low alkali metal ion transport efficiency. The preambles of original claims 8 and 34 are claim limitations that delineate the scope of the relevant prior art for the Applicants' improvement invention.

## SUMMARY

1. Clearly, the Applicants' Claims 8 -17 and Claims 34 - 35 are directed by the preamble to the chlorate cell technology prior art rather than to the chlor-alkali cell or any other electrolytic cell technology prior art because of the reliance during prosecution on the preambles of claims 8 and 34. In accordance with *Stencel* and *IMS Tech, Inc.*, the Applicants' claims must be evaluated for patentability against chlorate cell technology prior art.

2. But for the Examiner's refusal to enter the amendment under Rule 1.116 (presumably based upon an erroneous belief that the scope of Claims 8 and 34 is thus somehow changed thereby), the Applicants' Claims 8 and 34 would be now in Jepson form which, in accordance with *Rowe* and *Epcon Gas*, would clearly indicate the Applicants' intent to limit the scope of the claims to the chlorate cell technology prior art. It is clear that the proposed Jepson form of Claims 8 and 34 would not change the intended scope of the claims since the Applicants have consistently indicated during prosecution that the claims are limited to the chlorate cell prior art. However, the Jepson form of Claims 8 and 34 would be a clear indication, in accordance with *Bristol-Myers Squibb*, of the intended claim scope. Accordingly, it is believed that the Examiner has emphasized "form" over "substance" to contend that the Jepson form of Claim 8 would change the scope of the claims.

3. Aside from the Applicants' reliance upon the preambles of Claims 8 and 34 to distinguish Claims 8 and 34 from the chlor-alkali and other electrolytic cell

technology prior art, the recitation of the "low alkali metal ion transport efficiency...membrane" component clearly delineates Claims 8 - 17 from the cited electrolytic cell technology prior art.

## **II.**

### **THE ANTICIPATION REJECTIONS**

The Rejections under 35 U.S.C. 102 (b) Over The Patent references cited by the Examiner

a) Claims 8 - 12 and 17 are anticipated over Kelham, patent number US-4,902,397

b) Claims 8 - 12, 14, and 17 are anticipated over Cohn et al, patent number US-4,486,276

c) Claims 34 - 35 are anticipated over Sawamoto et al., patent number US-5,290,406

EVEN IF THE EXAMINER GIVES NO PATENTABLE WEIGHT TO THE PREAMBLE OF CLAIM 8, CLAIMS 8 - 12 AND 17 ARE NOT ANTICIPATED BY THE CITED REFERENCES

Claims 8 - 12 and 17 have been rejected as anticipated over Kelham ('397) with evidence from de Nora ('452) and de Nora et al. ('979). Each of these references are not considered prior art since they disclose only chlor-alkali electrolytic cells, as noted in Kelham, column 1, lines 40 - 44 and in the abstracts of the deNora and deNora et al. references. These references disclose only membranes which would not be useful in the claimed cell assembly (Claims 8 - 17) rather than those membranes recited (low alkali metal ion transport efficiency permselective membranes) which are used in the claimed cell assembly. The membranes disclosed in these references would have a different structure with different properties (i.e., high alkali metal ion transport efficiency) rather than the recited low alkali metal ion transport efficiency permselective membrane component of the cell of the assembly of the Applicants' claims 8 - 17.

Should the Examiner propose that the disclosure in Kelham of a Nafion membrane is a generic disclosure such that a genus of membranes sold under this trademark would anticipate the Applicants' species of Nafion membrane, it is submitted that the disclosure of Nafion membranes in Kelham would not suggest, for the following reasons, the Applicants' use of a low alkali metal ion transport efficiency permselective polymer membrane in the Applicants' claims 8 - 17.

In accordance with MPEP 2131.02, a chemical formula will anticipate a species covered by the formula only when the species can be "at once envisioned" from the

formula. Similarly, where a generic expression embraces a large number of species, the generic expression cannot be said to anticipate a particular species. Here, the generic expression "Nafion membrane" encompasses a large number of membranes having properties including the permeability of the membrane to various ions, as well as the rate of permeability of said ions. Accordingly, the disclosure of a Nafion membrane in Kelham cannot be said to disclose the Applicants' low alkali metal transport efficiency permselective polymer membrane.

It is submitted that the assumption of the Examiner that Kelham also discloses gas and liquid disengagers (12 and 18) is without basis in this reference. Reference to the drawing and the description thereof in Kelham, generally, column 7, lines 42 - 65 will show that only gaseous products (column 7, lines 42 - 45) are removed through pipe 11 (Fig. 1 of the drawing) and only gaseous products (column 7, lines 54 - 57) are removed through pipe 17, each of which, respectively, feed vessels 12 and 18. There is no suggestion in Kelham (the Examiner's suggestion is considered irrelevant) that vessels 12 and 18 would function as gas and liquid disengagers (separators) if a liquid should be passed (which is denied) with gaseous products through pipes 11 and 17. As indicated in Kelham, Figs. 1 and 2 and column 8, lines 1 - 4, the lower sections of vessels 12 and 18, which are located beneath membranes 15 and 21 are filled with an hydraulic liquid 24. Accordingly, where would any separated liquid be contained in vessels 12 and 18 since (as disclosed in column 8, lines 5 - 13) the remaining upper sections 13 and 19 are filled with gas?



The deNora and deNora et al. references cited with Kelham, as evidence to describe the permselective membrane, fail to disclose the applicants' low alkali metal ion transport efficiency permselective membrane but merely disclose membranes useful in chlor-alkali electrolytic cells.

**EVEN IF THE EXAMINER GIVES NO PATENTABLE WEIGHT TO THE  
PREAMBLE OF CLAIM 8, CLAIMS 8 - 12, 14, AND 17 ARE NOT  
ANTICIPATED BY THE CITED REFERENCES**

Claims 8 - 12, 14, and 17 have been rejected as anticipated over Cohn et al. ('276) with evidence from deNora ('452). Cohn et al. disclose an electrolytic cell, suitable for use in the electrolysis of alkali metal halide solutions, employing air or other oxygen containing gas to depolarize the cathode of a chlor-alkali cell (Column 1, lines 9 - 11). DeNora discloses only membranes useful in chlor-alkali electrolytic cells, i.e., those having high alkali metal ion transport efficiency. The cation exchange membrane of Cohn et al. is disclosed in column 3, lines 54 - column 4, line 23. Accordingly, these references, fail to disclose the Applicants' low alkali metal ion transport efficiency permselective membrane and, therefore, fail to anticipate Claims 8 - 12, 14, and 17, in which Claims 9 -12, 14, and 17 are dependent or ultimately dependent upon Claim 8, and which require as a component of the assembly of Claim 8, the low alkali metal ion transport efficiency membrane recited in Claim 8.

CLAIMS 34 AND 35 ARE NOT ANTICIPATED  
BY THE CITED REFERENCES

Claim 34 stands rejected as anticipated over Sawamoto et al. Sawamoto et al. is not considered prior art since this reference does not disclose an assembly including an electrolytic cell for the production of an alkali metal halate, as set forth in the preamble of claim 34. Accordingly, claim 34 is not anticipated. The Applicants submit that references disclosing electrolytic cells useful in the production of chlor-alkali and other products are not prior art which one skilled in this art would consider in evaluating the patentability of the Applicants' claimed invention.

THE OBVIOUSNESS REJECTIONS

The Rejection of Claims 13, 15, and 16 Under 35 U.S.C. 103 (a) over the  
References cited by the Examiner

a) Claim 13 is obvious under 35 U.S.C. 103 (a) over patent number US-  
4,902,397 in view of US-4,381,979;

b) Claim 15 is obvious under 35 U.S.C 103 (a) over patent number US-  
4,902,397 in view of US-4,426,269;

c) Claim 16 is obvious under 35 U.S.C. 103 (a) over patent number US-  
4,902,397 in view of US-4,105,531

EVEN IF THE EXAMINER GIVES NO PATENTABLE WEIGHT TO THE  
PREAMBLE OF CLAIM 8, DEPENDENT CLAIMS 13, 15, AND 16 ARE NOT  
RENDERED OBVIOUS BY THE CITED REFERENCES

None of the cited references teach or suggest the claimed assembly for the production of an alkali metal halate using a low alkali metal ion efficiency permselective membrane recited in independent claim 8 (Claims 13, 15, and 16 being ultimately dependent thereon), the cited references merely teaching chlor-alkali electrolytic cells having permselective membranes suitable for chlor-alkali cell use, i.e., having high alkali metal ion permeability. The Applicants do not predicate unobviousness in Claims 13, 15, and 16 upon the composition of the anode or cathode of the cell of the claimed assembly. Thus, the precious metal coated anode of deNora would not render obvious Claim 13. Similarly, the cathode coating of Brown would not render Claim 15 obvious. Similarly, the cathode of Kuo et al. would not render obvious Claim 16.

The Rejection of Claims 34 - 35 Under 35 U.S.C. 103 (a) Over Sawamoto et al. in view of Kuo et al.

**CLAIMS 34 - 35 ARE NOT RENDERED OBVIOUS BY THE CITED  
REFERENCES**

Claim 35 (34 ?) has been rejected as obvious over Sawamoto et al. ('406) in view of Kuo et al. ('531). Since neither of these references disclose or suggest an assembly for the production of an alkali metal halate, these references are not considered prior art. It is considered that this combination of references would not render obvious the assembly recited in the Applicants' claim 34 (from which claim 35 depends). The scope limiting preamble of new claim 34 together with the clear reliance on the claim preamble by the Applicants during the prosecution of the application transforms the preamble into a claim limitation (MPEP 2111.02 (II), last two paragraphs).

**III.**

**THE CLAIMS ARE BASED UPON AN ENABLING DISCLOSURE  
IN ACCORDANCE WITH 35 U.S.C. 112 FIRST PARAGRAPH**

**Claims 8 - 17 are enabled**

Clearly, independent claim 8 is directed to an assembly including a cell for the production of an alkali metal halate, rather than directed to a permselective membrane. Nevertheless, the Examiner has rejected claims 8 - 17 as non-enabling based upon the extent of disclosure of the low alkali metal ion transport efficiency

permselective polymer membrane. There is no requirement in section 112 of 35 U.S.C. that a proprietary component of an apparatus be described in how to make terms when such component is known and available to those skilled in the art as shown in the Affidavit under Rule 1.132, submitted after the final rejection. One skilled in this art would know of the properties of the commercially available Nafion permselective membranes. The presumption of the Examiner that such is not the case is baseless and contrary to the facts set forth in the Affidavit. Accordingly, the Applicants' disclosure of the recited low alkali metal ion transport efficiency permselective membrane is sufficient under the statute.

It is believed that the Examiner has confused the issue of the enablement of the Applicants' assembly invention by emphasis on requiring a disclosure of how to make the permselective membrane component of the assembly invention of claims 8 - 17. Apparently, the Examiner erroneously concludes that the Applicants' invention is the low alkali metal ion transport efficiency permselective polymer membrane recited as a component in Claim 8 from which Claims 9 - 17 depend or ultimately depend.

The Examiner has indicated that the scope of the disclosure of the membrane component having an alkali metal ion transport efficiency of less than 60 % to less than 20 % is not enabled. The Examiner states that the scope of enablement in the specification is insufficient for the claimed membrane. In accordance with MPEP 2164.08, the scope of enablement must only bear a reasonable correlation to the

scope of the claims, as set forth in *In re Goffe*, 542 F2d 564, 567, 191 USPQ 429, 431 (CCPA 1976) in which the Court stated:

"[T]o provide effective incentives, the claims must adequately protect inventors. To demand that the first to disclose shall limit his claims to what he has found will work or to materials which meet the guidelines specified for "preferred" materials in a process such as the one herein involved would not serve the constitutional purpose of promoting progress in the useful arts."

It is acknowledged, as indicated in MPEP 2164.03, that the scope of the required enablement may vary inversely with the degree of predictability involved, but even in unpredictable arts, such as in the field of chemistry, a disclosure of every operable species is not required. Here, the Applicants are the first to disclose an assembly, including an electrolytic cell which contains a cell separator, useful for the production of an alkali metal halate. As such, the Applicants have disclosed a "Pioneer Invention". The Applicants' claims must adequately protect the invention against those who come after and make improvements thereon. It is only reasonable that the scope of the Applicants' claimed invention not be limited to the low alkali metal ion transport efficiency permselective polymer membrane disclosed in the Applicants' Example 10 since to do so would leave the field open to others to seek

protection for the use of similar membranes having even lower alkali metal ion transport efficiency than the membrane disclosed in the Applicants' Example 10. The scope of enablement must only bear a reasonable correlation to the scope of the claims.

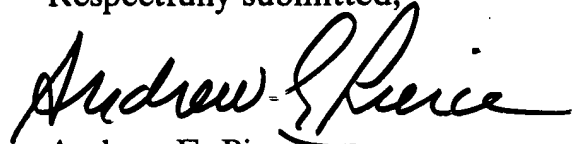
### CONCLUSIONS

In conclusion, (1) none of the prior art relied upon by the Examiner relates to electrolytic cells for the production of alkali metal halates. The technology of chlor-alkali electrolytic cells is not pertinent to the electrolytic cells for the production of alkali metal halates. The prior art cells for the production of alkali metal halates have no cell separator. Unless a cell separator is employed in the alkali metal halate cells, the corrosive, aqueous sodium chlorate electrolyte would make impossible the use of (a) precious metal cathodes or (b) gas-diffusion cathodes and allow the resultant reduction in energy use and other advantages obtained with the inventive assembly including an electrolytic cell. (2) The invention of claims 8 - 17 has been disclosed in accordance with 35 U.S.C. 112. The Applicants' "invention" is not the low alkali metal ion transport efficiency membrane component of the

claimed assembly and, therefore, need not be disclosed in how to make terms. The requirement of the Examiner for disclosure of how to make the low alkali metal ion transmission permselective membranes is not appropriate since such membranes are commercially available and thus, can be selected by one skilled in this art without experimentation, as set forth in the Affidavit under Rule 1.132.

It is respectfully urged that a reversal of the Examiner and allowance of Claims 8 - 17 and 34 - 35 is in order.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Andrew E. Pierce". The signature is fluid and cursive, with the first name "Andrew" being more prominent than the last name "Pierce".

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## CLAIMS APPENDIX

8. An assembly for the continuous, cyclic production of an alkali metal halate comprising an electrolytic cell, a gas and liquid disengager for a catholyte stream, and a gas and liquid disengager for an anolyte stream, said electrolytic cell comprising a low alkali metal ion transport efficiency permselective polymer membrane separating an anode compartment and a cathode compartment, and a catalytic, metal anode and a catalytic metal cathode or a catalytic, metal anode and a gas-diffusion cathode.

9. The assembly of claim 8, wherein said permselective polymer membrane has less than about 60 % alkali metal ion transport efficiency.

10. The assembly of claim 9, wherein said permselective polymer membrane has less than about 50 % alkali metal ion transport efficiency.

11. The assembly of claim 10, wherein said permselective polymer membrane has less than about 20 % alkali metal ion transport efficiency.

12. The assembly of claim 9, wherein said catalytic, metal anode comprises a precious metal oxide deposited on a tantalum or titanium substrate.

13. The assembly of claim 12, wherein said catalytic, metal cathode comprises a precious metal oxide deposited on a nickel or titanium substrate.

14. The assembly of claim 9, wherein said cathode is a gas-diffusion cathode.

15. The assembly of claim 9, wherein said catalytic, metal cathode is selected from the group consisting of alloy mixtures of nickel-molybdenum, cobalt molybdenum, nickel-tungsten, cobalt-tungsten, nickel-iron, and nickel-cobalt on a nickel or steel substrate.

16. The assembly of claim 9, wherein said catalytic, metal cathode comprises an alloy coating of molybdenum, vanadium, and nickel on a copper substrate.

17. The assembly of claim 8, wherein said polymer membrane is characterized by less than about 20% alkali metal ion transport efficiency, high hydrogen ion

transport efficiency, and cation exchange groups selected from the group consisting of carboxylic acid and sulfonic acid groups.

34. An assembly for the continuous, cyclic production of an alkali metal halate, comprising an electrolytic cell, a gas and liquid disengager for a catholyte stream, and a gas and liquid disengager for an anolyte stream, said electrolytic cell comprising a permselective polymer membrane separating an anode compartment and a cathode compartment, a catalytic, metal anode and a catalytic metal cathode or a catalytic, metal anode and a gas-diffusion cathode.

35. The assembly of claim 34, wherein said catalytic, metal anode comprises a precious metal oxide deposited on a tantalum or titanium substrate.

## **EVIDENCE APPENDIX**

A copy is attached of an Affidavit under Rule 1.132, filed June 2, 2006, which was sent back to the Examiner for consideration after entry in accordance with a partly favorable decision on petition, mailed August 14, 2006.

## **RELATED PROCEEDINGS APPENDIX**

None



**FC-10 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Applicant: Jackson et al.

Examiner: WILKINS, III, H.D.

Serial No.: 10/601,602

Group Art Unit: 1742

Filing Date: June 23, 2003

For: Low Energy Chlorate Electrolytic Cell and Process

Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**AFFIDAVIT UNDER 37 CFR 1.132**

State of South Carolina

County of Richland

John Robert Jackson being a graduate of Queens University, Kingston, Ontario, Canada with a degree in Chemical Engineering, having about 28 years of experience in the field of electrochemistry as a Research Chemist and Research Manager, presently employed with the Applicant's Assignee, Kemira Finnchem USA, Inc. in Eastover, South Carolina and an inventor in the above identified patent application, being duly sworn, deposes and says that he is informed and therefore believes and avers:

*Technical  
Development  
JRS  
May 26/06*

That the Examiner in the above-identified patent application has twice rejected the applicants' claims 8 - 17 as failing to comply with the enablement requirement of 35 USC 112, first paragraph, which reads in pertinent part as follows:

"The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains or with which it is most nearly connected, to make and use the same..." (emphasis added)

That as can be seen from an inspection of pending claims 8 - 17, the invention claimed in the above-identified application which must be described in the specification in accordance with the above quoted statement is an "assembly" which includes as a component thereof a low alkali metal ion transport efficiency permselective polymer membrane. The applicants' invention is NOT the permselective polymer membrane, which is merely a component of the assembly. Since the polymer membrane is commercially available, one skilled in this art could make the assembly of the invention without a disclosure by the applicants of how to make the polymer membrane used in the assembly.

That the above-identified patent application on page 14, first paragraph, would be considered by one skilled in this art to be merely a generic disclosure of a permselective polymer membrane, for instance, those sold under the tradename Nafion. Since such membranes for use in electrolytic cells to separate anode and cathode compartments of chlor-alkali cell have high transport efficiency for alkali metal ions of the order of 92 - 96 %, modification of this membrane base to provide

the required low alkali metal ion transport efficiency permselective polymer membrane component of the claimed assembly is necessary to provide the desired properties. A useful species of a Nafion membrane is identified as Nafion 551 in Example 10 of the above-identified patent application.

That Nafion is a tradename for a series of Teflon polymers modified to have ionic properties which constitutes a new class of polymers termed "ionomers". The ionic properties of these ionomers are created by the addition of sulfonic acid or other groups into the bulk polymer matrix.

That one skilled in this art would not, upon reading the applicants' patent application consider that ALL Nafion membranes would have the required low alkali metal ion transport efficiency properties in view of the wide diversity of polymer membranes and materials available under this tradename, for instance:

1. Polymer membranes of perfluorosulfonic acid sold under the tradename Nafion 112, 1135, 115, and 117.
2. Polymer membranes of perfluorosulfonic acid reinforced with Teflon fiber in the Nafion series 300, 400, and 900, specifically, Nafion 324, 350, 424, and 961.
3. Polymers in powder, pellet, and dispersion form of perfluorosulfonic acid polymers which are sold under the tradenames Nafion NR 50 and SAC - 113.



That Nafion 551 disclosed in the applicants' patent application, Example 10, as useful, is an example of a perfluorosulfonic acid polymer further modified to have the desired low alkali metal ion transport efficiency properties by the addition of Teflon fibers to a base perfluorosulfonic acid polymer so as to produce the useful membrane component of the applicants' claimed assembly. Membranes sold, for example, under the tradenames Nafion 112, 1135, 115, and 117 being unmodified by the addition of Teflon fibers would not have the desired properties of low alkali metal ion transport efficiency; instead, these membranes are characterized by high alkali metal ion transport efficiency.

That a series of useful perfluorosulfonic acid polymer membranes can be prepared by modification with various amounts of Teflon fibers so as to obtain the low alkali metal ion transport efficiency required, as set forth in the applicants' pending claims 8 - 17.

FURTHER, affiant saith not.

John R. Fentim  
Affiant

Sworn to and subscribed to before me, a notary public on this 26 day of May 2006.

(Seal)

Dennis R. Mart  
Notary  
Commission expires 8-5-08